Anderson Civic Center Microgrid

Presented by:
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Before the Public Service Commission of South Carolina
Allowable Ex Parte Briefing
ND-2019-21-E

September 25, 2019

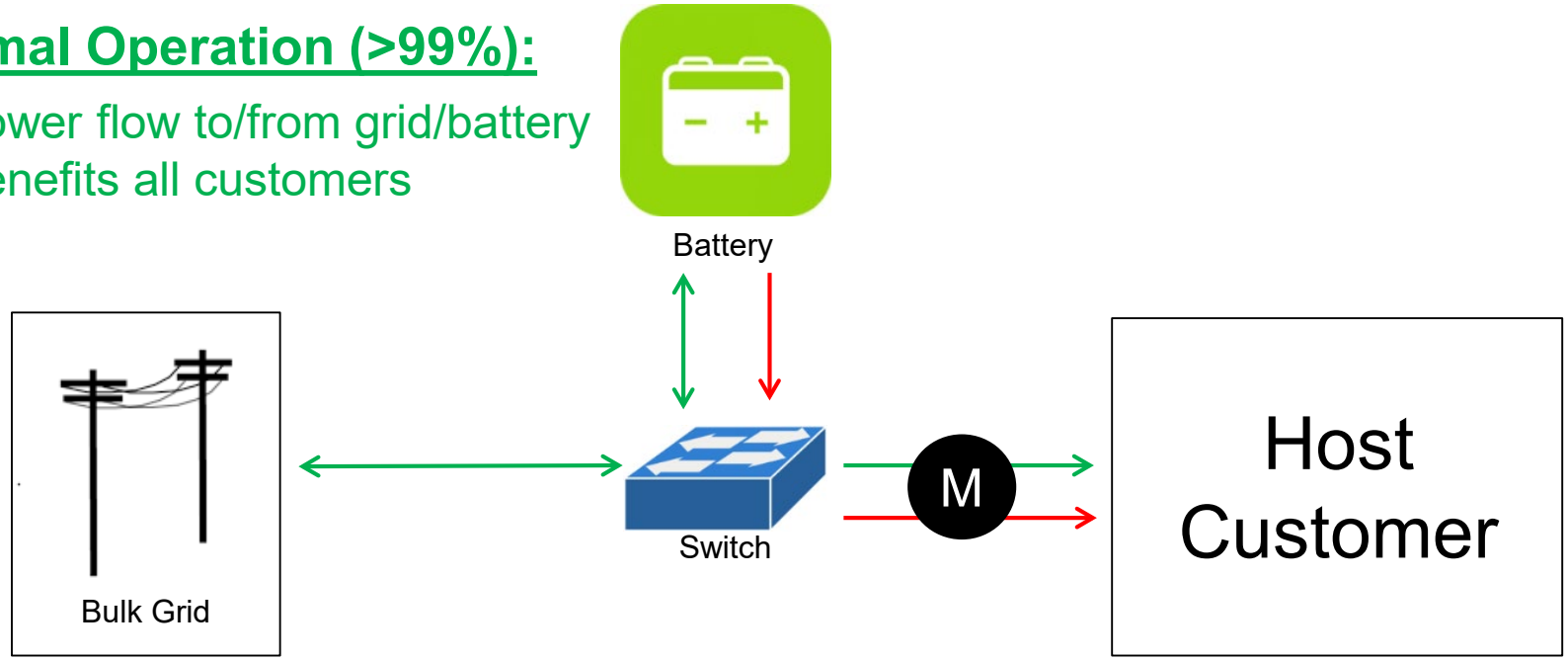
Agenda

- Microgrid and Energy Storage Background
- Duke's experience, current projects, and planned projects
- Anderson Civic Center Microgrid Overview
- Next steps discussion

Microgrid Overview

Normal Operation (>99%):

- Power flow to/from grid/battery
- Benefits all customers



Emergency Operation (<1%):

- Power flow from battery to Host Customer

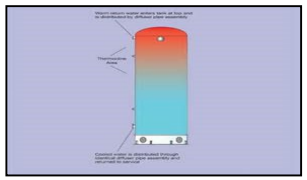
Energy Storage Overview

Energy storage is accomplished by devices or physical media that store energy to perform useful operation at a later time.

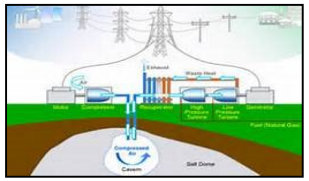
- Potential to eliminate real time need to balance generation with demand
- Enables variable generation to become mainstream
- Supports increased grid reliability
- Supports reliable distributed grid concepts
- Potential avoidance of future plant build for peaking needs
- Creates new customer products and services opportunities

Today's Focus

Thermal Storage



Compressed Air Storage

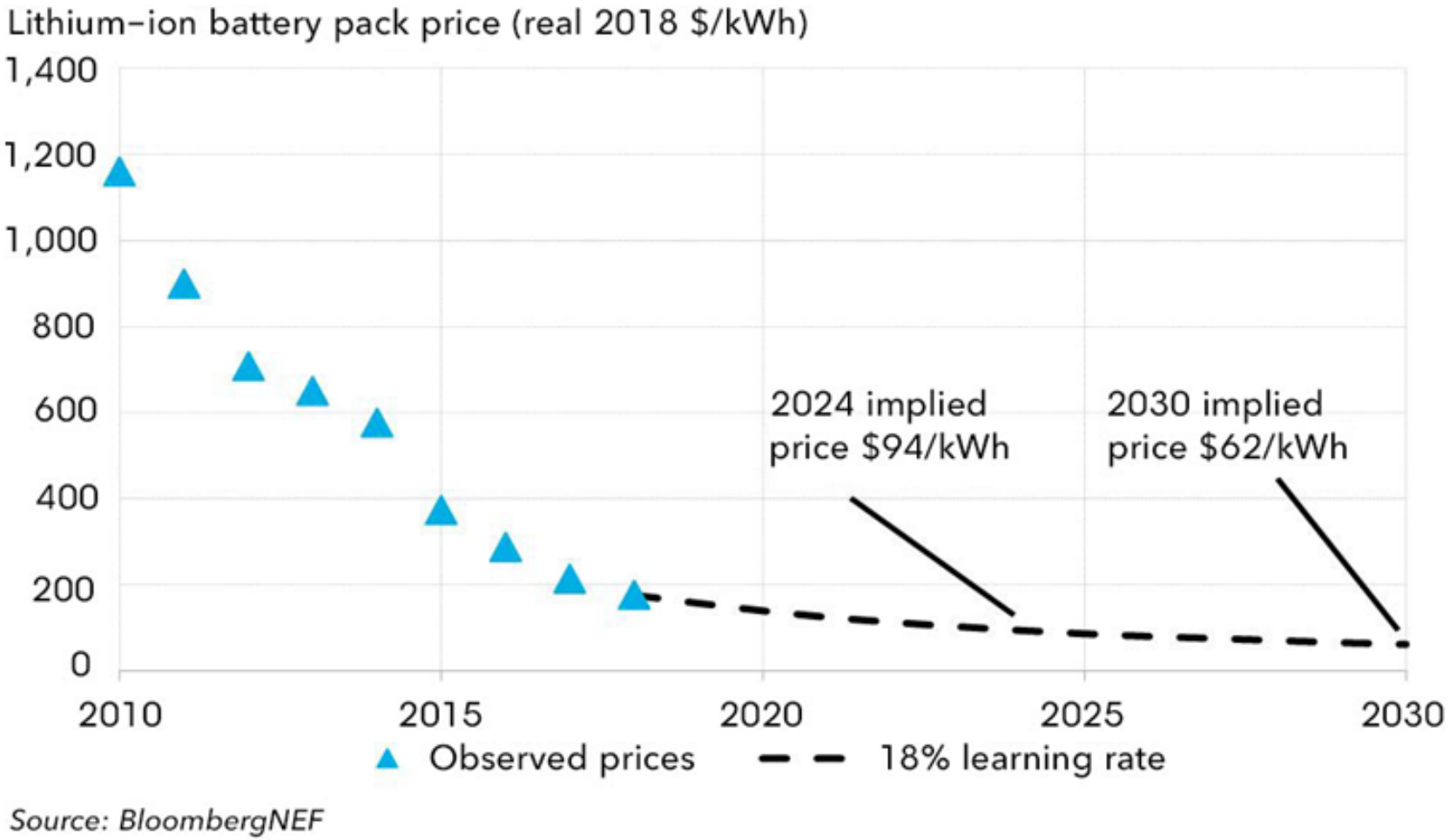


Inertia / Flywheel Storage

Battery Storage

Hydro Storage

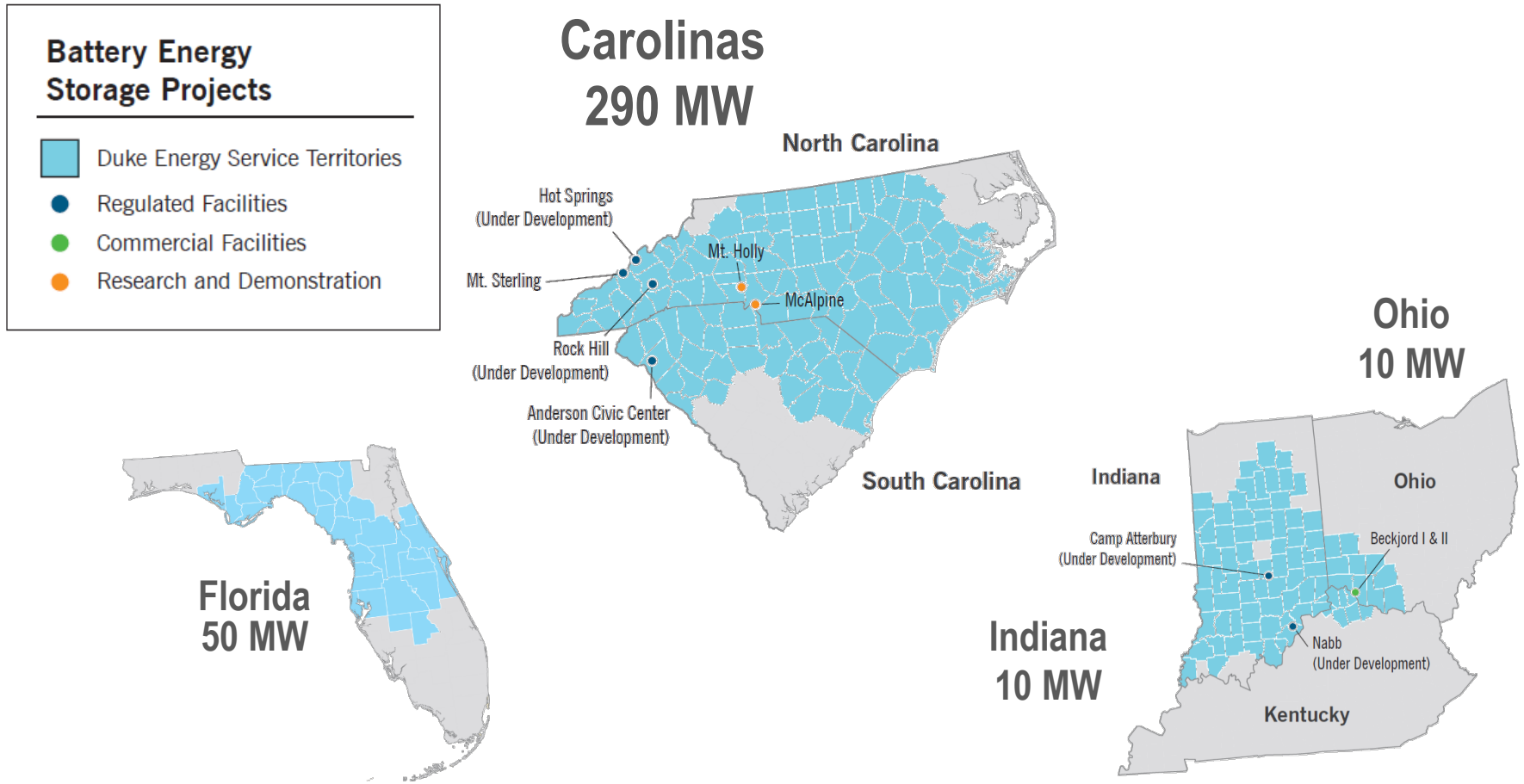
Lithium-Ion Price Trend



Source: BloombergNEF

Plummeting battery costs are helping create use cases for utilities

Energy Storage Experience and Future Plans



Why at the Anderson Civic Center?

SCDHEC is charged with identifying Medical Needs Shelters which are used during sustained outages and require alternative power sources.

Anderson Civic Center provides the following emergency needs:

- SC Department of Health and Environmental Control
  - Special Medical Needs Shelter (Largest shelter in SC – Capacity for 500 patients + 500 caregivers)
  - Distribution point for Strategic National Drug Stockpile
  - Weather Emergency Shelter (hurricane, ice storm, extreme heat/cold)
  - Oconee Nuclear Station Evacuation Shelter
- Anderson School District Five (students brought here if schools are evacuated)
  - Westside High School
  - Whitehall Elementary School
- American Red Cross – shelter for disaster victims

Anderson Civic Center meets/exceeds the following technical criteria:

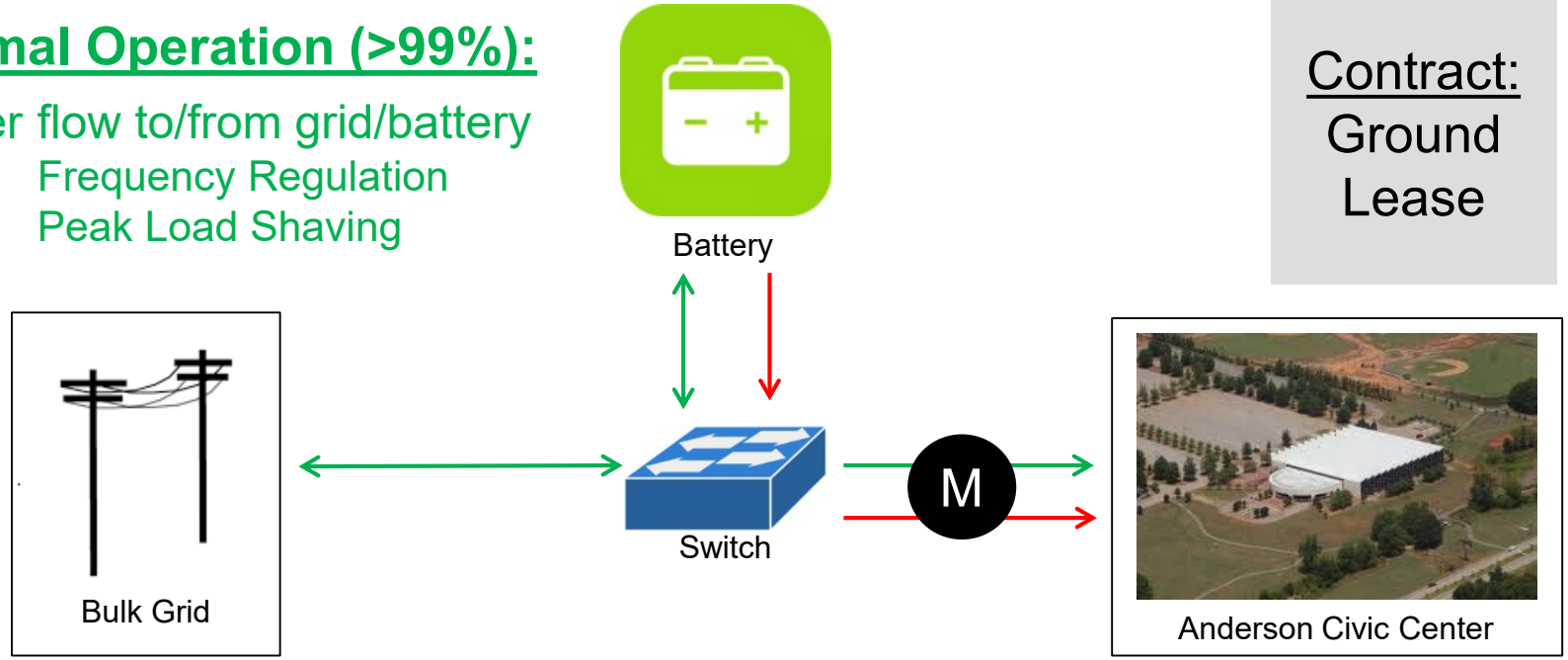
- Interconnection: Proximity to existing substation with capacity available
- Land size and availability: Adequate for battery storage system

How the ACC Microgrid Works

Normal Operation (>99%):

Power flow to/from grid/battery

- Frequency Regulation
- Peak Load Shaving



Contract:
Ground
Lease

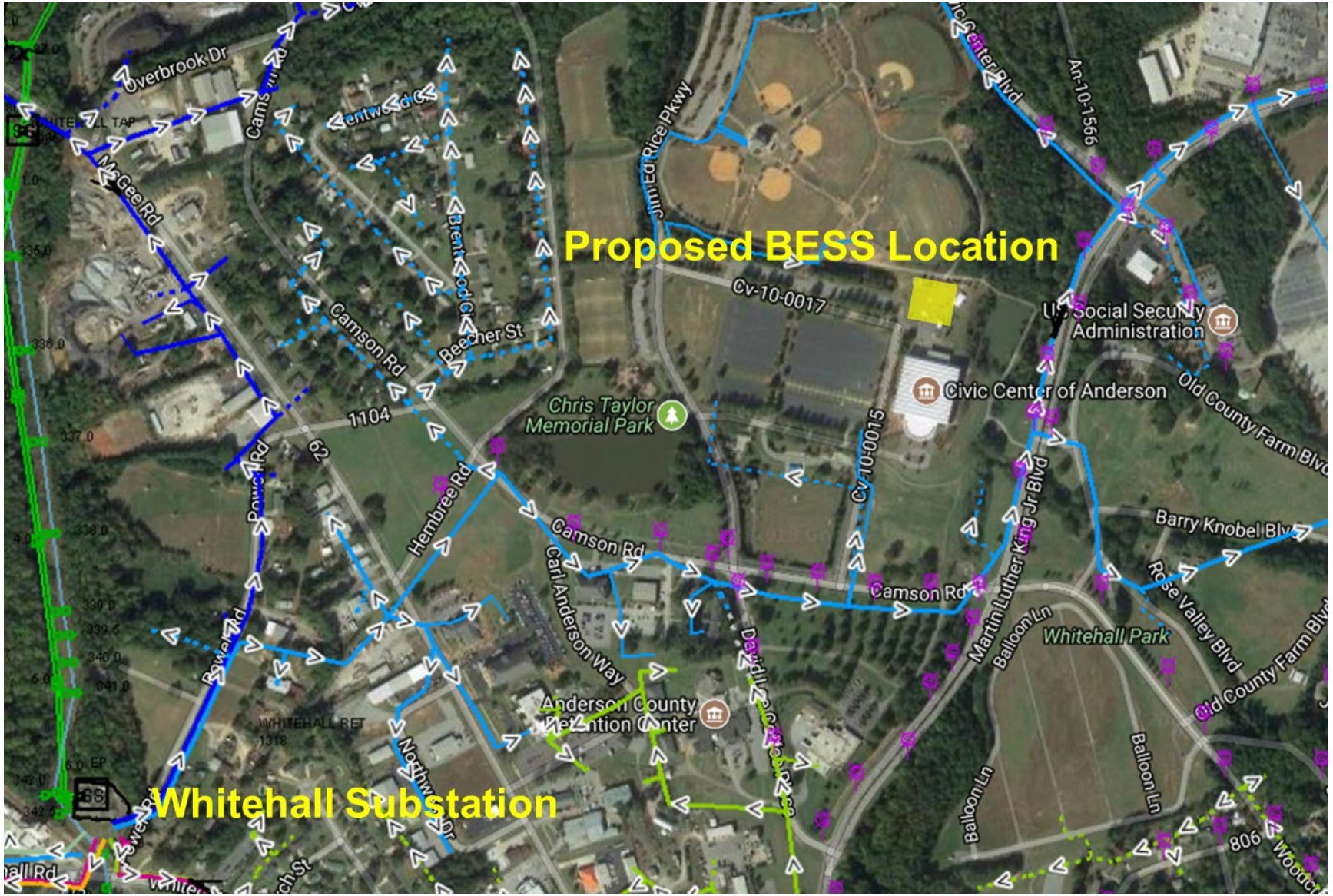
Emergency Operation (<1%):

Power flow from battery to
Anderson Civic Center

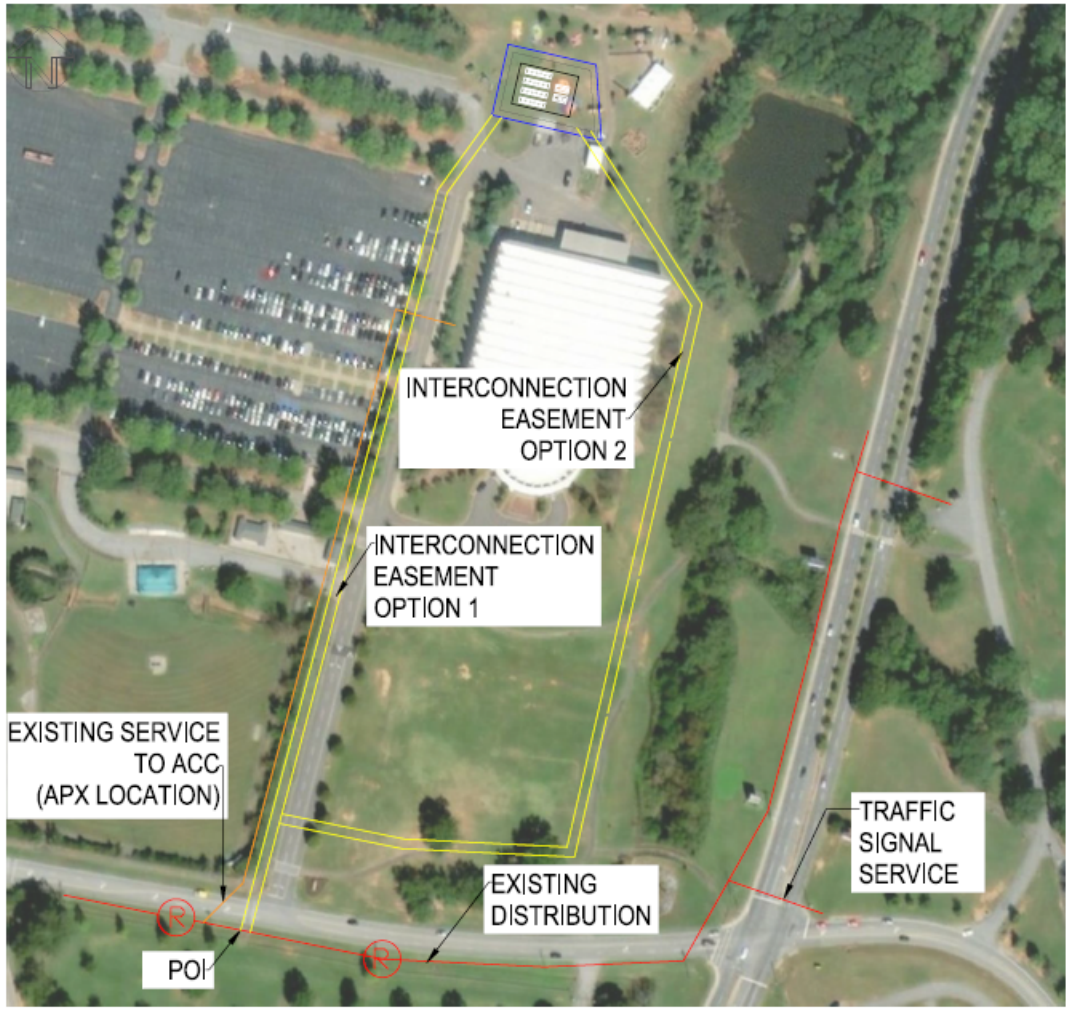
Project Timeline

- Execute land lease with Anderson County: November 2018 - Complete
- File Interconnection Request with DEC: November 2018 – Complete
- File Application with the Commission October 2019 - Target
- Receive Interconnection Study Results: 4Q 2019 - Estimated
- Competitive RFP procurement process: 1Q 2020
- Contract with selected vendor executed: 2Q 2020
- Battery Placed in Service: 1Q 2021

Anderson Civic Center – Site Layout



Anderson Civic Center – Site Layout



MICROGRID INFORMATION	
APPROXIMATE ADDRESS	3027 MARTIN LUTHER KING JR BLVD ANDERSON SC 29625
SITE LOCATION (LAT, LONG)	34.536209, −82.678763
INTERCONNECTION CAPACITY	5,000 KW AC
POI DISTANCE	850 FEET (APX)
AC CAPACITY	5,000 KVA
ENERGY CAPACITY	5,000 KWH

NOTES:

- ALL LOCATIONS ARE APPROXIMATE
- RECLOSERS TO BE ADDED FOR MICROGRID ISOLATION
- TRAFFIC SIGNAL AND UP TO 5 STREET LIGHTS ALONG CAMSON RD WILL REMAIN ENERGIZED WHEN THE MICROGRID IS ISOLATED

REV	DATE	JOB NO.	PROJECT TYPE	DES	DFTR	CHKD	ENGR	APPD	DESCRIPTION
0	10/30/18		BESS				SFB		FOR PRELIMINARY REVIEW

DUKE ENERGY

FILENAME: SITEPLAN_CVG.DWG

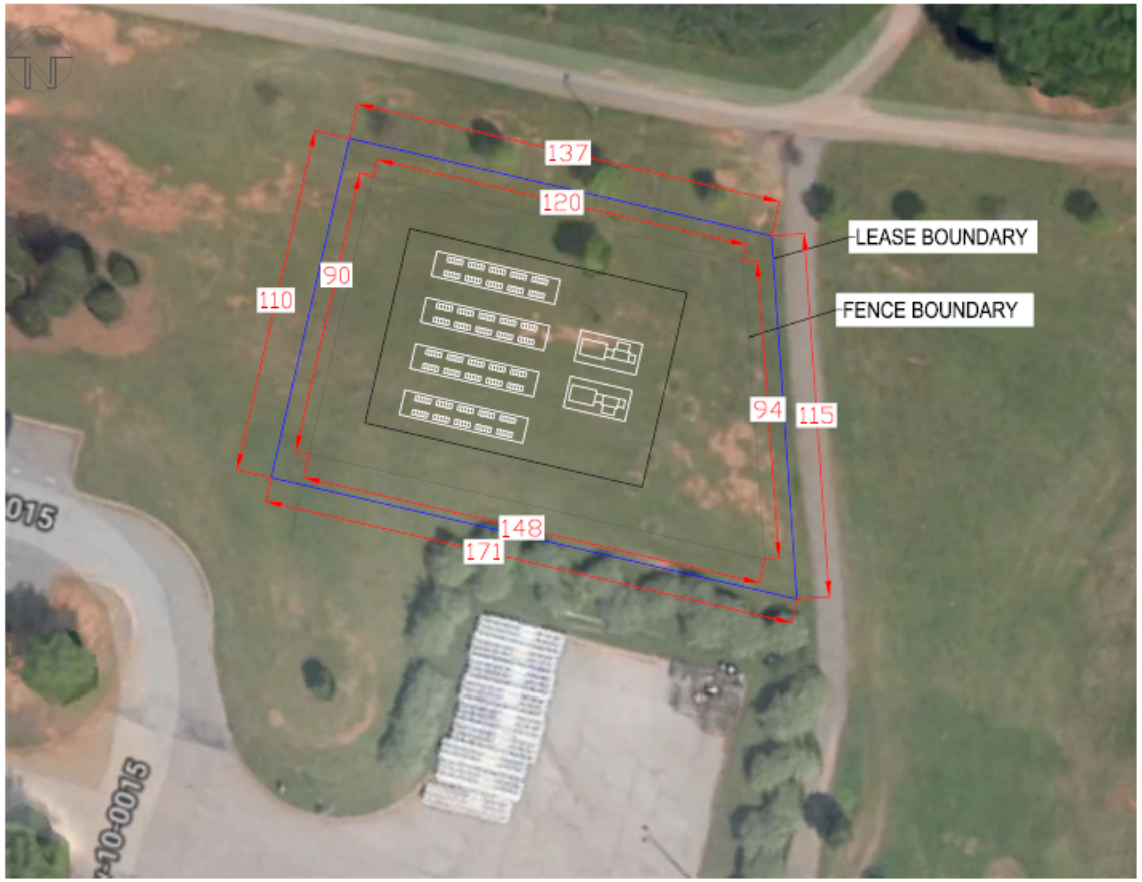
SCALE: NTS | DWG TYPE: PLAN | JOB NO: | DATE: 10/30/18 | DES: | DFTR: | CHKD: | ENGR: SFB | APPD:

TITLE: CONCEPTUAL SITE PLAN

FOR: ANDERSON COUNTY CIVIC CENTER SOLAR

DWG SIZE	DRAWING NO.	SHEET NO.	REVISION
ANSI B 11"x17"			0

ACC Battery Energy Storage System Layout



PLANT INFORMATION	
APPROXIMATE ADDRESS	3027 MARTIN LUTHER KING JR BLVD ANDERSON SC 29625
SITE COORDINATES (LAT, LONG)	34.538749, −82.679978
INTERCONNECTION CAPACITY	5,000 KW AC
INVERTER	SMA 2500-EV-US
INVERTER CAPACITY	2500 KVA
INVERTER COUNT	2
AC CAPACITY	5,000 KVA
ENERGY CAPACITY	5,000 KWH

NOTES:
- ALL LOCATIONS ARE APPROXIMATE

REV	DATE	JOB NO.	PROJECT TYPE	DES	DFTR	CHKD	ENGR	APPD	DESCRIPTION
2	11/13/18		BESS				SFB		UPDATE EQUIPMENT AND LAYOUT
1	09/04/18		BESS				SFB		UPDATE BESS CAPACITY AND LAYOUT
0	06/25/18		BESS				SFB		FOR PRELIMINARY REVIEW

DUKE ENERGY
FILENAME: SITEPLAN_ACC.DWG

SCALE: NTS | DWG TYPE: PLAN | JOB NO: | DATE: 06/25/18 | DES: | DFTR: | CHKD: | ENGR: SFB | APPD:

TITLE: CONCEPTUAL SITE PLAN
FOR: ANDERSON COUNTY CIVIC CENTER BESS

DWG SIZE	DRAWING NO.	SHEET NO.	REVISION
ANSI B 11"x17"			1

Review of Project Benefits

- Frequency Regulation (Benefits all DEC customers)
- Peak Load Shaving (Benefits all DEC customers)
- Power quality and reliability improvement (Benefits local customers)
- Backup power to critical facility (Benefits ACC)
- Integration of energy storage assets into operations
- Confirmation of modeled assumptions for future projects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